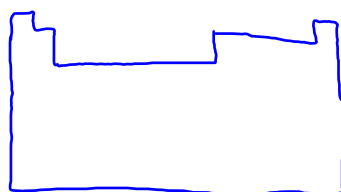


Periodic Table Continued:

- Group 2 \rightarrow Alkaline Earth Metals
 - $2e^-$ in valence energy level
 - Often react with Oxygen family
- Groups 3-12 \rightarrow Transition Metals
 - Good conductors of heat and electricity
 - Valence electrons will vary
 - Can bond with many elements in a variety of shapes
- Group 13 \rightarrow Boron Family
 - most are metals
 - Boron is a metalloid
 - 3 valence e^-

- Groups 14 and 15
 - 14 is Carbon Family
 - 15 is Nitrogen Family
 - Contain metals, non-metals, and metalloids
- Group 16 → Oxygen Family
 - Contains metals, metalloids, non-metals
 - React very well with Alkaline Earth Metals
- Group 17 → Halogens
 - All are non-metal
 - React with Alkali Metals
- Group 18 → Noble Gases
 - All exist as gases
 - Not reactive because they have a full valence energy level
 - He has $2e^-$ in valence energy level
 - All others have $8e^-$ in valence energy level
- Rare Earth Metals



Lanthanide Series
Actinide Series

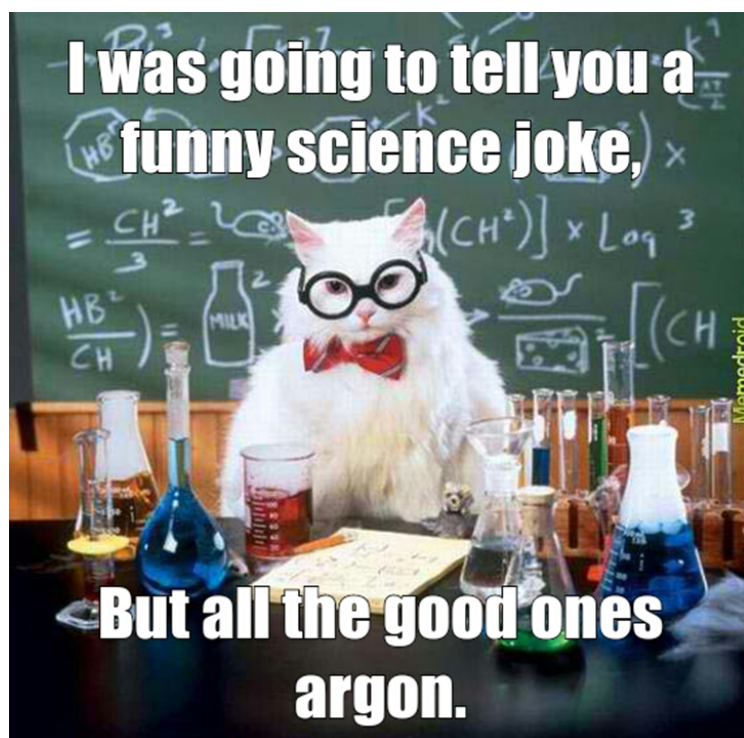
- Rare Earth Metals continued:
 - Some are radioactive
 - Appearance is silver, silvery-white, or gray
 - Good conductors of heat and electricity

Oxidation Numbers:

- All atoms want to be "happy"
- Atoms want to have a stable outer energy level \rightarrow then they are "happy"
- How do they become "happy"?
 - Atoms gain or lose electrons to have a stable outer energy level
 - Usually the most stable configurations involve 8 valence e^-
 - $8e^- = \text{full octet}$

- Octet Rule:

- Atoms form bonds with other atoms in order to have 8 valence electrons
- Atoms either share or transfer e^-
- Noble gases do not bond with other elements because they already have a full octet



1+																		0					
H 1	2+																	3+	4+	3-	2-	1-	He 2
Li 3	Be 4	Transistion metals - variable oxidation numbers										B 5	C 6	N 7	O 8	F 9	Ne 10						
Na 11	Mg 12											Al 13	Si 14	P 15	S 16	Cl 17	Ar 18						
K 19	Ca 20	Sc 21	Ti 22	V 23	Cr 24	Mn 25	Fe 26	Co 27	Ni 28	Cu 29	Zn 30	Ga 31	Ge 32	As 33	Se 34	Br 35	Kr 36						
Rb 37	Sr 38	Y 39	Zr 40	Nb 41	Mo 42	Tc 43	Ru 44	Rh 45	Pd 46	Ag 47	Cd 48	In 49	Sn 50	Sb 51	Te 52	I 53	Xe 54						

- Oxidation Number:

- Indicates how many e^- are gained or lost
- Range from -4 to $+4$

- Predicting Oxidation Numbers:

1. Determine valence e^- of a neutral atom

2. Determine if atom will gain or lose e^-

- Which would be faster: going to \emptyset or to $8e^-$?

3. Count $\#e^-$ gained or lost.

- Lose e^- , charge of ion is positive (+)
- Gain e^- , charge of ion is negative (-)

